

NEWBORN BLOOD MERCURY CONCENTRATION AND AUTISM RISK

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Background and Aims: Because mercury is a neurotoxin, it has been investigated as a potential cause of autism, but little information is available on the association with prenatal mercury exposures. In this study, we (1) addressed the relationship between maternal third trimester fish consumption (the primary source of methylmercury) and bloodspot mercury concentration, (2) determined if there is an association between bloodspot mercury concentration and the development of autism, and (3) assessed if child's glutathione S-transferase class M1 (GSTM1) genotype modified the relationship between bloodspot mercury concentration and autism risk.

Methods: Childhood Autism Risks from Genetics and the Environment (CHARGE) is a comprehensive, population-based case-control study with participants sampled from three strata: children with autism, children with developmental delay but not autism, and the general population. We measured total mercury concentrations in newborn bloodspots (representing prenatal exposures) using inductively coupled plasma mass spectrometry (ICP-MS). To predict bloodspot mercury concentration, we fit linear regression models with maternal fish consumption. Multiple logistic regression models were fit to assess the association between bloodspot mercury concentration and developmental outcome (autism versus typical development), adjusting for potential confounders, and assessing for effect modification by the inclusion of a product term between bloodspot mercury concentration and GSTM1 genotype.

Results: Maternal third trimester fish consumption significantly predicted bloodspot mercury concentration. With regard to developmental outcome (autism vs. typical development), the OR for a one unit natural log increase in bloodspot mercury concentration was 0.79 (0.50, 1.23). In the GSTM1 active and null strata, ORs for developmental outcome for a natural log increase in blood mercury concentration were 0.94 (0.53, 1.68) and 0.77 (0.45, 1.32), respectively.

Conclusions: We did not find a significant association between bloodspot mercury concentration and autism risk. Mercury concentration did not increase autism risk in GSTM1 active or null subgroups. Investigation into other potentially genetically vulnerable subgroups is warranted.